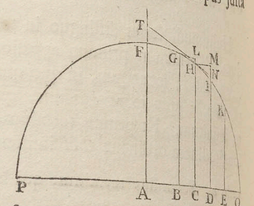
De Motu Corporum

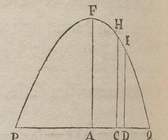
$\frac{AC}{CH}$, id eſt, ut tangentis longitudo illa HT, quæ ad ſemidiametrum AF ipſi PQ normaliter inſiſtentem terminatur: & reſiſtentia erit ad gravitatem ut $3a$ ad $2n$, id eſt, ut $3AC$ ad circuli diametrum PQ: velocitas autem erit ut $\sqrt{CH}$. Quare ſi corpus juſta cum velocitate ſecundum lineam ipſi PQ parallelam exeat de loco F, & medii denſitas in ſingulis locis H ſit ut longitudo tangentis HT, & reſiſtentia etiam in loco aliquo H ſit ad vim gravitatis ut $3AC$ ad PQ, corpus illud deſcribet circuli quadrantem FHQ. *Q. E. I.*



At ſi corpus idem de loco P, ſecundum lineam ipſi PQ perpendicularem egrederetur, & in arcu ſemicirculi PFQ moveri incipere, ſumenda eſſet AC ſeu a ad contrarias partes centri A, & propterea ſignum ejus mutandum eſſet & ſcribendum $-a$ pro $+a$. Quo pacto prodiret medii denſitas ut $-\frac{a}{e}$. Negativam autem denſitatem, hoc eſt, quæ motus corporum accelerat, natura non admittit: & propterea naturaliter fieri non poteſt, ut corpus aſcendendo a P deſcribat circuli quadrantem PF. Ad hunc effectum deberet corpus a medio impellente accelerari, non a reſiſtente impediri.

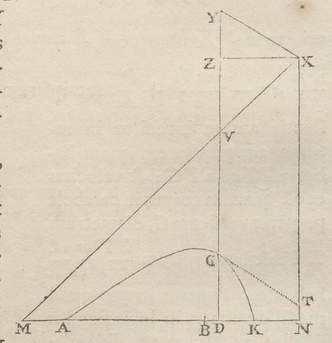
Exempl. 2. Sit linea PFQ parabola, axem habens AF horizonti PQ perpendicularem, & requiratur medii denſitas, quæ faciat ut projectile in ipſa moveatur.

Ex natura parabolæ, rectangulum PDQ æquale eſt rectangulo ſub ordinata DI & recta aliqua data: hoc eſt, ſi dicantur recta illa b; PC, a; PQ, c; CH, e; & CD, o; rectangulum $a+o$ in $c-a-o$ ſeu $ac-aa-2ao+co-oo$ æquale eſt rectangulo b in DI, ideoque DI æquale $\frac{ac-aa}{b}+\frac{c-2a}{b}o-\frac{oo}{b}$. Jam ſcribendus eſſet hujus ſeriei ſecundus terminus $\frac{c-2a}{b}o$ pro Qo, tertius item



item terminus $\frac{oo}{b}$ pro Roo. Cum vero plures non ſint termini, debebit quarti coefficiens S evaneſcere, & propterea quantitas $\frac{S}{R\sqrt{1+QQ}}$, cui medii denſitas proportionalis eſt, nihil erit. Nulla igitur medii denſitate movebitur projectile in parabola, uti olim demonſtravit *Galilæus*. *Q. E. I.*

Exempl. 3. Sit linea AGK hyperbola, aſymptoton habens NX plano horizontali AK perpendicularem; & quæratur medii denſitas, quæ faciat ut projectile moveatur in hac linea.



Sit MX aſymptotos altera, ordinatim applicatæ DG productæ occurrens in V; & ex natura hyperbolæ, rectangulum XV in VG dabitur. Datur autem ratio DN ad VX, & propterea datur etiam rectangulum DN in VG. Sit illud bb: & completo parallelogrammo $DNXZ$; dicatur BN, a; BD, o; NX, c; & ratio data VZ ad ZX vel DN ponatur eſſe $\frac{m}{n}$. Et erit DN æqualis $a-o$, VG æqualis $\frac{bb}{a-o}$, VZ æqualis $\frac{m}{n}\overline{a-o}$, & GD ſeu $NX-VZ-VG$ æqualis $c-\frac{m}{n}a+\frac{m}{n}o-\frac{bb}{a-o}$. Reſolvatur terminus $\frac{bb}{a-o}$ in ſeriem convergentem $\frac{bb}{a}+\frac{bb}{aa}o+\frac{bb}{a^3}oo+\frac{bb}{a^4}o^3$ &c. & fiet GD æqualis $c-\frac{m}{n}a-\frac{bb}{a}+\frac{m}{n}o-\frac{bb}{aa}o-\frac{bb}{a^3}o^2-\frac{bb}{a^4}o^3$ &c. Hujus ſeriei terminus ſecundus $\frac{m}{n}o-\frac{bb}{aa}o$ uſurpandus eſt pro Qo, tertius cum ſigno mutato $\frac{bb}{a^3}o^2$ pro Ro^2, & quartus cum ſigno etiam mutato $\frac{bb}{a^4}o^3$

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